HWY-05-M-H035
Wilmer, Texas

ATTACHMENT #5

MCI 102E Series Maintenance Manual
Section 15 - Wheels, Hubs and Tires

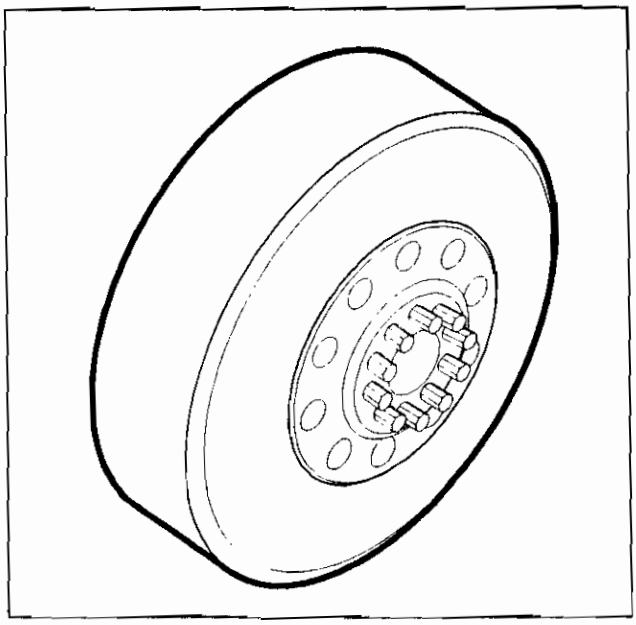
(20 pages)

SECTION 15
WHEELS, HUBS AND TIRES

This section consists of three primary subsections. Select the subsection that covers the information required. Then turn to the subsection index for a complete listing of subjects covered. Tool information will be found after the appropriate subsection.

The three primary subsections are:

A - Wheels
B - Hubs
C - Tires



SECTION 15A

WHEELS

CONTENTS OF THIS SECTION

GENERAL DESCRIPTION

Wheel attachment

The wheels and attaching hardware installed on the E-Model coaches differ substantially from previous MCI coaches. The E-Model uses hub-piloted (or hub mount) wheels and hardware exclusively. This system differs from stud-piloted wheels in many ways:

1. Stud-piloted wheels are designed to be centered by the nuts on the studs. The seating action of the chamfered wheel nuts in the chamfered wheel bolt holes centers the wheel on the hub, and provides both clamping force and wheel locating forces.

2. The stud-piloted wheel has clearance between the wheel center hole and the hub surface. On the other hand, hub-piloted wheels are designed to center on the hub at the center hole or bore of the wheel. Because of this feature, hub mount wheels need a close tolerance center hole-to-register on the machined surfaces provided on the hub.

3. Hub mount wheels are used with two-piece flange nuts (see Figure 1) which contact the wheel disc face around the bolt hole and do not rely on contacting the bolt hole chamfer to function properly. The wheel nuts provide only clamping force, as the locating forces are provided by the hub-to-wheel interface.

4. Hub mount wheels have straight-through bolt holes with no chamfers, which provides a visual way of identifying hub mount wheels from stud mount wheels, which have large chamfers.

5. Stud mount nuts have a chamfered face, whereas hub mount nuts have a flat face. Also, the hub mount nuts are of a two-piece design, where the flange is allowed to rotate with respect to the threaded hex portion of the nut. The flange is mechanically retained to the hex portion.

6. The wheel studs and nuts used on the E-Model coaches have metric hex and threads, which require a 33 mm. socket.

7. Stud mount nuts use right and left-handed threads on opposite sides of the coach, whereas hub mount nuts are all right-handed and are interchangeable side to side.

The dual wheel mounting on the drive axle differs even more. The stud mount dual wheels found on other coaches use an inner and an outer nut to attach the two wheels. The inner cap-nut has internal and external threads, and retains only the inner wheel. The outer wheel is retained separately, using an internal threaded nut which attaches to the external threads of the inner cap-nut. The hub mount system uses only an outer nut, which sandwiches both wheels together against the hub. The wheel studs are longer, but provide only clamping load and not wheel locating loads.

Wheels

NOTE: Wheels conform to The Tire and Rim Association specification SAE J694.

The wheel size on the E-Model is also different from previous MCI coaches. Due to the 16,000 lb. front axle rating, only 22.5 X 9.00 wide wheels are sufficiently rated to carry this load with 315/80R22.5 tires.

NOTE: This tire mounted on a 8.25 wide wheel is also insufficiently rated to carry this load.

Both steel and aluminum rims are offered on the E-Model, both in the 22.5 x 9.00 size. The aluminum wheels are polished and have 10 hand holes. The steel wheels are painted and have 5 hand holes.

The steel wheels require a valve stem with a special bend to clear the disc brakes' calipers installed on the E-Model. This is not an industry-standard bend, although it uses an industry-standard straight stem. Either obtain the correctly-bent valve stem from an authorized MCI parts distributor or have it bent by the tire installer to match the stem provided from the factory.

Aluminum wheels use an industry-standard valve stem.

CAUTION

Do NOT mix the wheel and attaching hardware between systems. Use only hub mount wheels and metric, two-piece flange nuts on E-Model coaches. Do NOT use stud mount wheels on E-Models.

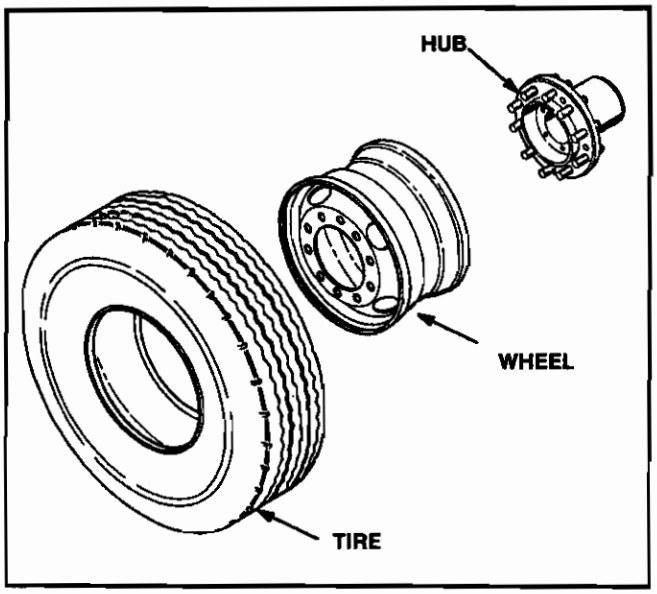


Figure 1. Tire, Wheel & Hub and Drum

MAINTENANCE

WARNING

Never work under a unit supported only by a jack. Always support the coach with stands, per section 3F. Disable the ECAS by shutting off the main battery disconnect switch. Block the wheels before releasing the park brake.

PERIODIC INSPECTION

The mounting and attachment of the wheel to the axle wheel end assembly is an important maintenance concern. Observe the following periodic checks to maintain the best wheel and tire performance.

1. Check that wheel stud nuts are tightened to the proper torque specifications as shown at the end of this section.

NOTE: Tighten wheel stud nuts every 100 miles (161 km) for the first 500 miles (805 km), and whenever new wheels have been installed.

2. Inspect all wheels for cracks, bent bead rims or other damage.

NOTE: A worn hub face could be caused by running with the wheels too loose. If the wear is not too excessive, the entire hub face can be machined flat. Replace a badly worn hub. Replace any broken or cracked hubs.

CAUTION

Painting wheels can affect the torque retention of the wheel mounting nuts. Paint thickness and the hardness of the cured paint are the two factors that can affect the torque retention of the nuts. The current MCI specification allows a 3.0-mil maximum thickness.

The wheel mounting nuts lose torque very quickly on freshly-painted wheels. It is important to allow sufficient time for the paint to cure to a hard and durable state before putting the wheels into service. Baking the newly painted wheels will accelerate the curing. Air drying requires approximately seven days for proper curing.

An excessively thick coat of paint can cause a rapid loss of torque on the wheel nuts as the paint wears away. Remove any excessive paint from critical mounting surfaces.

NOTE: Keep wheel studs and nuts free from grease and oil. Normally no lubricant would be used when installing wheel attachment hardware; however, corrosion or galling of the stud and nut attachment may reach a point where removal can be difficult.

When reusing two-piece wheel nuts, apply two drops of oil at one point between the nut flange and the thread (Figure 2). This allows the flange to rotate freely and provide the proper clamping force when tightened. Motor oil or general purpose lubricating oils may be used. Do not use excessive amounts of lubricant; it will not improve performance. Instead, it will make the nut hard to handle, attract dirt and cause unsightly appearance. Only USED nuts need lubrication.

ILLUSTRATION TO BE ADDED

FIGURE 2. Wheel nut lubrication

If extreme corrosion conditions are a persistent problem, apply a light application of anti-seize compound to the first three threads of the studs or fluted inner wheel nuts.

CAUTION

It is important to note that using anti-seize compounds may cause inaccurate fastening torques.

NOTE: Nylon spacers should be installed between the hub and rotor assembly and the wheel center disc section.

WHEEL REMOVAL AND INSTALLATION

WARNING

Wheel and tire assemblies weigh more than 200 pounds (90 kg). Use caution while unfastening the wheel from hub, and when lifting it off the studs.

The spare tire and wheel are in a compartment directly behind the front bumper (Figure 3). The jack for raising the coach is in the center of the spare wheel. Gain entry by releasing the bumper retaining lever inside the front side service compartment.

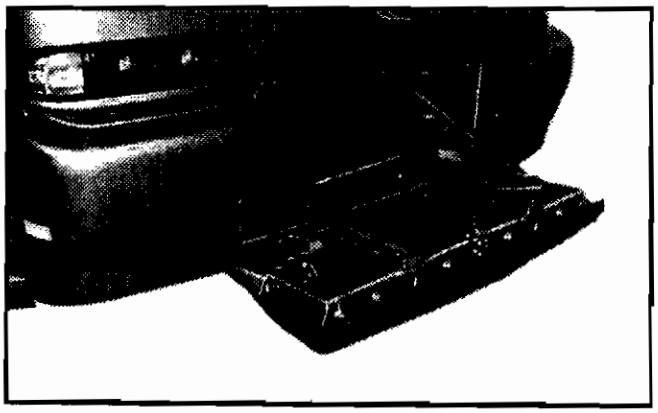


Figure 3. Spare tire compartment

Front or trailing axle removal

1. Turn the front wheel straight ahead in preparation for wheel removal
2. Run the flat tire up on the run-up block. Stop the coach and apply the parking brake. (The run-up block is in the battery compartment. The jack and lug wrench are in the spare tire compartment behind the front bumper.)

Figure 4. Jacking the wheel

3. Place the bottle jack under the axle beam near the wheel. Position the jack so that the ram of the jack fits into the round recess at the bottom of the axle beam. Operate the jack to partially raise the wheel (Figure 4).

NOTE: It may be necessary to drive the coach onto a run-up block to gain sufficient clearance for jacking (Figure 5).

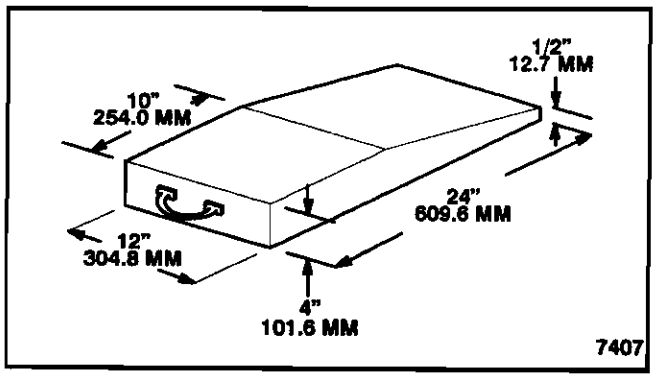


Figure 5. Run-up Block

4. Before the tire is completely off the ground, partially loosen the wheel nuts. (Use the lug wrench provided in the spare tire compartment.)

WARNING

The wheel and tire assemblies weigh more than 200 lbs. (90 Kg). Use caution when loosening the wheel nuts, and when lifting the wheel off the hub.

5. Raise coach completely, remove the run-up block, and remove the wheel nuts.

Front or trailing axle installation

Installation is the reverse of removal.

1. Before installing the wheels, lubricate the hub pilot pads with an anti-seize compound to prevent galling. Do not lubricate any other surface of the wheel or hub.

2. Place one of the pilot pads at the 12 o'clock position to center the wheel precisely and reduce run-out. The coach has hub-mounted wheels which use two-piece metric flange nuts.

3. Be certain that the wheel is squarely mounted against the hub before fully tightening the wheel nuts.

4. Torque the wheel nuts to between 400 and 500 foot-lbs using the sequence shown (Figure 6.)

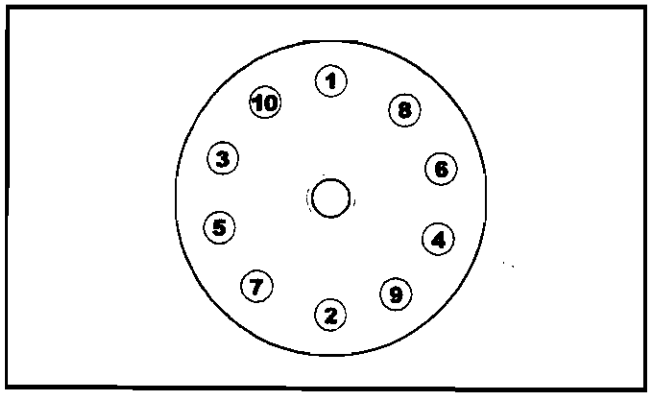


FIGURE 6

Drive Axle removal

1. Run the inflated tire up onto the run-up block. Stop the coach and apply the parking brake.

2. Place the bottle jack under the drive axle beam and near the wheel (Figure 7). Position the jack so that the ram of the jack fits the recess at the bottom of the jacking pad. The jack pad is on the rear face of the drive axle beam below the suspension support structure attachment. Operate the jack and partially raise the wheel.

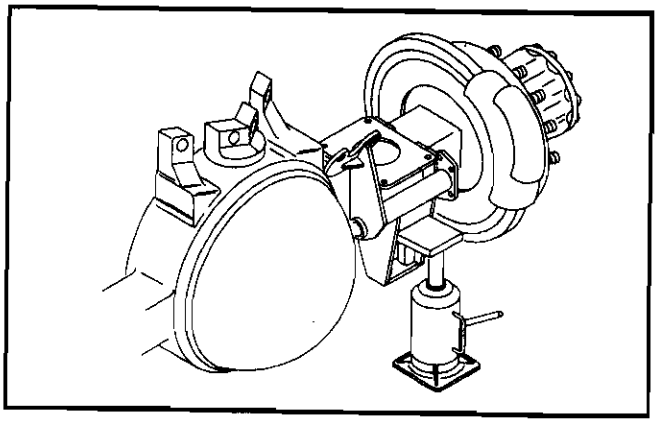


FIGURE 7

3. Before the tire is completely off the ground, partially loosen the wheel nuts.

WARNING

The wheel and tire assemblies weigh more than 200 lbs. (90 Kg). Use caution when loosening the wheel nuts, and when lifting the wheel off the hub.

4. Raise the wheel completely, remove the run-up block, and remove the wheel nuts and the wheel and tire assemblies as required.

Drive axle installation

Installation is the reverse of removal. The coach has hub-mounted wheels which use two-piece metric flange nuts.

1. Be certain that both wheels are properly seated to the hub pilot before fully tightening the nuts.

2. Torque the wheel nuts to a value of between 400 and 500 foot pounds, using the sequence shown in Figure 6.

WARNING

The drive axle wheels are hub-mounted, so the outer wheels retain both the outer and inner wheels. Use caution therefore when removing the nuts and tire assemblies.

MISCELLANEOUS TORQUE SPECIFICATIONS

Front Axle Wheels (Hub-Piloted Aluminum or Steel)	400-500 ft-lbs (542-678 N·m)
Drive Axle Wheels (Hub-Piloted Aluminum or Steel)	400-500 ft-lbs (542-678 N·m)
Trailing Axle Wheels (Hub-Piloted Aluminum or Steel)	400-500 ft-lbs (542-678 N·m)

SECTION 15B

HUBS

CONTENTS OF THIS SECTION

GENERAL DESCRIPTION

The coach wheels, tires and rotors attach directly to the hub assembly, which is a major part of the axle wheel end components. All of the axle's wheel components are specially designed to handle axle loadings while spinning on the spindle. All wheel components are lubricated by an oil bath. This section details the proper maintenance procedures for all wheel end components.

The E-Model coach uses new hub assemblies that differ from previous MCI models. All hubs use pressed-in wheel studs, and the rotors are attached using separate fasteners. The drive axle is further revised to incorporate unitized seals with Teflon™ sealing material. These new seals combine the seal outer housing, sealing element and wiper into a single replaceable unit, and are pressed into the seal cavity as one assembly. There is no longer a separate wiper or bolted retainer.

COMPONENTS

WHEEL END ASSEMBLY

The coach wheel end assembly is made up of several components. The forged hub is machine to close tolerances for installation of seals, bearing cups, hub caps and wheel alignment studs. Front and rear cone-type roller bearings with their assorted attachment and adjusting hardware are required to properly mount the hub. The hub's inner wheel and front hub cap or axle shaft flange (rear axle) seal the hub to prevent lubricant from escaping.

HUB CAP

Front and trailing axle hubs use hub caps with an integral sight glass. The sight glass allows for convenient checking of oil levels. A rubber composition snap plug in the center of the hub cap helps to maintain correct oil levels (Figure 1).

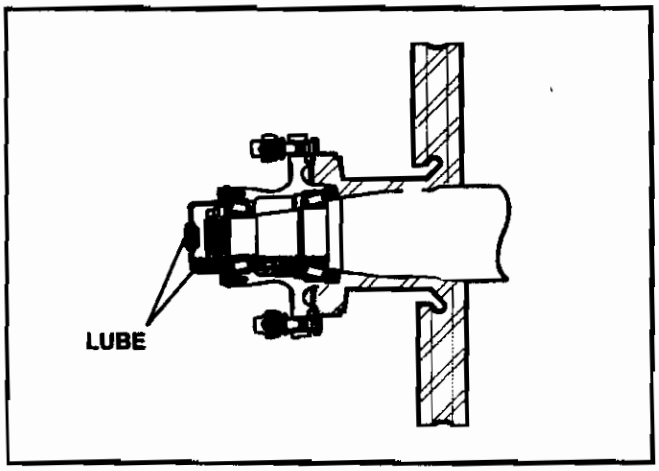


Figure 1. Sight glass and lube level

MAINTENANCE

NOTE: The maintenance procedures outlined in this section deal with important coach service issues. Read each procedure through completely before beginning any operation.

LUBRICATION

Check the wheel bearing lubricating oil levels daily. If oil is not visible at the sight gauge level mark, add sufficient

oil. Use lubrication specifications S-9 and S-10 (multi-purpose gear oil) for the front and trailing axle, and S-14a (synthetic gear oil) for the drive axle. (See Section 10 for specification information.)

Filling the front and trailing axle hubs

1. Pry out the rubber sight glass stopper plug.

CAUTION

Do not overfill the hubs.

2. Fill the hub cavity until oil appears in the lower area of the clear plastic filler's boss ring. This boss is identified by the level indicator arrow on front of the filler.
3. Reinstall the rubber plug.
4. Operate the coach and recheck the level.

Filling the Drive Axle hubs

The drive axle hubs are lubricated by differential oil. During normal driving, oil sloshes into the hub cavities at either end of the axle, and the excess runs out and returns to the differential sump. Therefore, checking the lubricant level at the differential is sufficient to check lubricant at the hub. The lubricant level at the carrier fill plug should be level with the bottom of the plug opening.

However, when the bearings have been serviced and no oil is present in the hub, oil must be made to fill the hub cavity. This can be done in two ways:

1. Add oil to the differential sump, and then, before driving the coach, tip the axle in both directions by running onto run-up blocks to allow oil to run into the hubs.

2. Use the fill plugs provided in the axle shaft flanges to add oil directly to the hub cavity. Remove the plug, and using an appropriate funnel, add 1 U.S. pint of oil to each hub. The excess will run into the differential sump. Then fill the differential sump to the appropriate level.

NOTE: The Rockwell drive axle has been specified with the "Advanced Lubrication" package, which requires the use of full synthetic differential oil. It is not recommended to mix regular petroleum oil with synthetic oil when servicing the hub bearings. Use only synthetic oil.

INSPECTION

Inspect the wheel end components every 100,000 miles (160,000 km) for correct bearing adjustment and end play. Also inspect wheel seals at this time. Refer to the following removal and disassembly procedures for front, trailing, and drive axle wheel end components. If any components need replacement, use these procedures with the specific adjustment and replacement procedures that are detailed later in this section.

Front and trailing axle (Figure 2)

WARNING

Coach wheels weigh more than 200 lbs (90 kg.) To avoid injury, use extreme care when removing them.

1. Block the coach from moving, jack the axle wheel end, and remove the wheel.

NOTE: Refer to section 3F of this manual for lifting and jacking instructions.

2. Remove the brake caliper from the torque plate. Refer to Section 4C for this procedure.

3. Unfasten the hub cap mounting screws and lockwashers and remove the hub cap and gasket (if present).

NOTE: Check for proper bearing adjustments at this time. If the bearings need replacement or the seal is to be inspected, continue with the procedure.

4. Bend up the tang on the locking washer. Unfasten and remove the jamnut, locking washer, and lock ring. Unfasten and remove the bearing adjusting nut.

5. Remove the outer cone bearing, and pull the hub assembly off the spindle. Use care to avoid damage to the seal assembly.

6. Remove the inner cone bearing.

7. Clean all the hub parts in a suitable cleaning solvent, using a stiff brush to remove old lubricant and dirt. Using similar methods, clean any dirt or other build-up from the spindle's seal area.

NOTE: Take care to avoid having bristles lodge in the bearing.

8. Inspect the spindle and hub bore for nicks and burrs, removing any with an emery cloth or file.

9. Inspect the bearings for excessive wear, deterioration, cracking, scoring or pitting on the bearing cups, rollers, or cones. Replace any bearings with

these defects, following the bearing cup replacement procedure found later in this section.

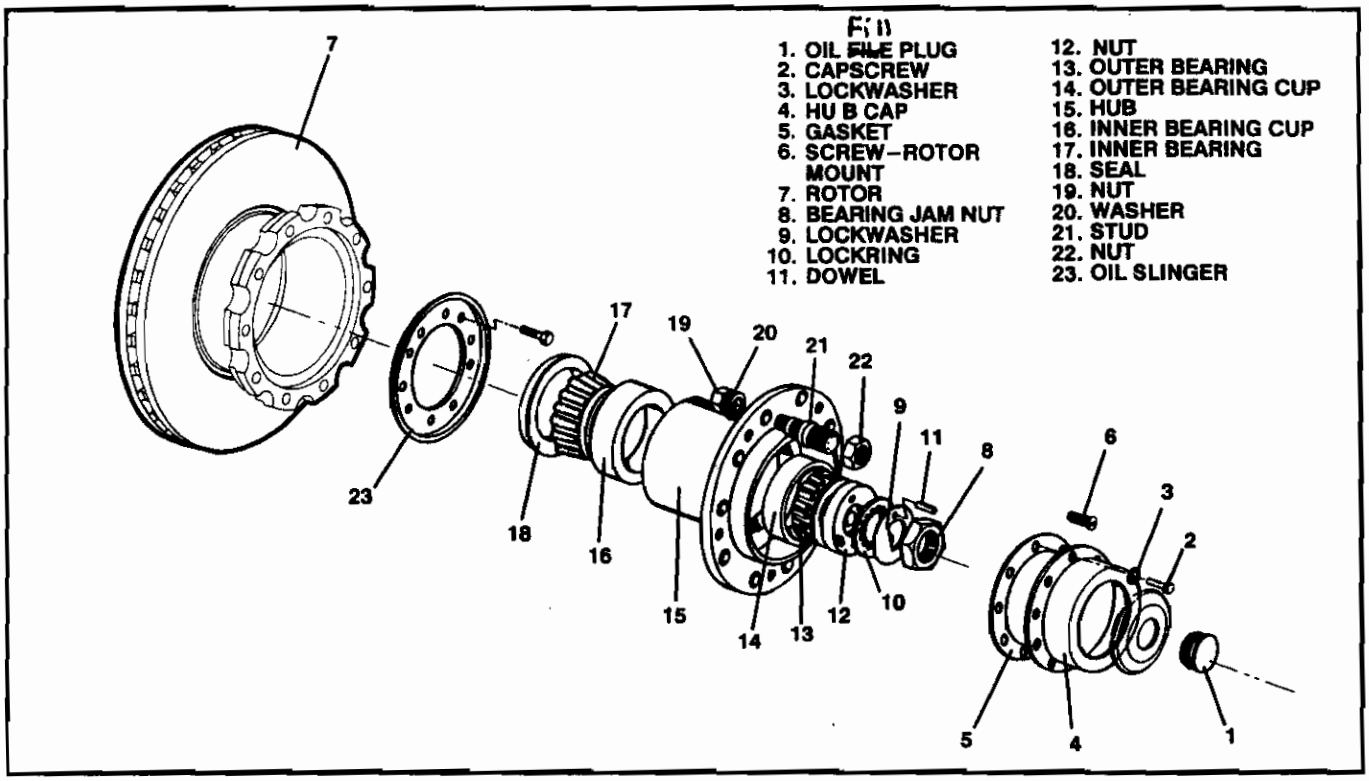


Figure 2. Front and trailing hub and drum

CAUTION

Do not use compressed air to dry the bearings, because this might force dirt farther into the bearing.

WARNING

The tire, wheel, hub and drum assemblies could weigh over 300 lbs (135 kg) together. When doing seal inspections, therefore, remove the tire and wheel from the hub first, or use an approved tire dolly. This will prevent injury or damage to the seal.

10. When inspecting wheel seals, look for wear, deterioration, distortion or damage at the sealing surfaces. Replace any damaged or defective seals using the seal replacement procedure found later in this section.

11. Reassemble and mount the components in the reverse order and do a bearing adjustment.

12. Reinstall the hub cap using a new gasket and lockwashers. Torque the screws to 20 to 30 ft-lbs (27 to 41 N m).

13. Reinstall the brake caliper and adjust the brakes.

Check the lubrication levels and top up the oil if necessary. Reinstall the wheels using the procedure in Section 15A.

Drive axle (Figure 3)

WARNING

Coach wheels weigh more than 200 lbs (90 kg.) To avoid injury, use extreme care when removing them.

1. Block the coach from moving, jack the axle wheel end, and remove the wheel.

NOTE: Refer to section 3F of this manual for lifting and jacking instructions.

2. Remove the brake caliper from the torque plate. Refer to Section 4C for this procedure.

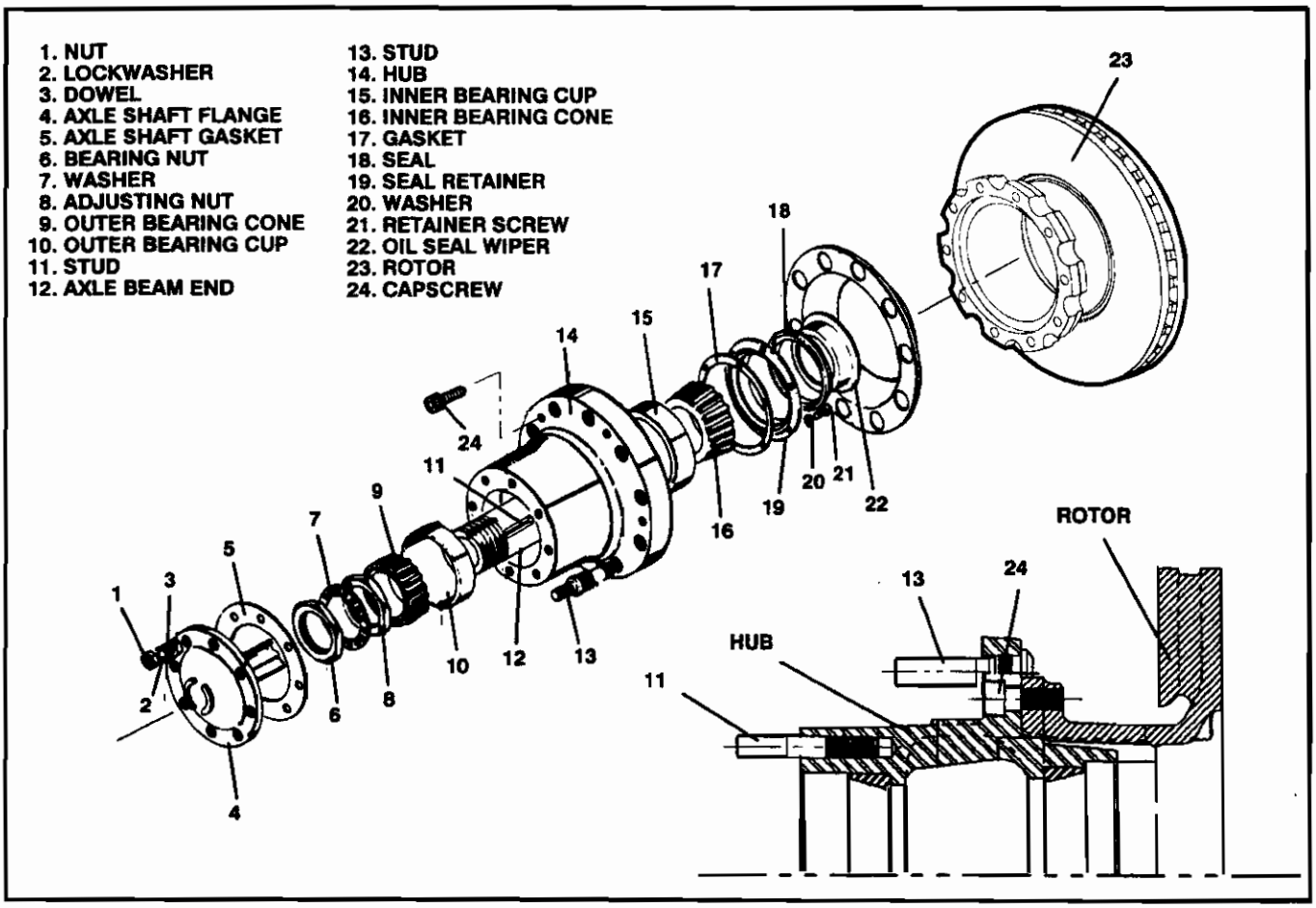


Figure 3. Drive Axle

3. Bend up the tang on the lockwasher (if present). Unfasten and remove the jamnut and lock ring. Unfasten and remove the bearing adjusting nut.

4. Remove outer bearing cone, and the pull hub and rotor assembly off the spindle.

5. Remove wheel seal and inner bearing cone from the hub cavity.

6. Clean all the hub parts in a suitable cleaning solvent, using a stiff brush to remove old lubricant and dirt. Using similar methods, clean any dirt or other build-up from the spindle seal areas.

NOTE: Take care to avoid having bristles lodge in the bearing.

CAUTION

Do not use compressed air to dry the bearings, because this might force dirt farther into the bearing.

7. Inspect the spindle and hub bore for nicks and burrs, removing any that are found with an emery cloth or file.

8. Inspect the bearings for excessive wear, deterioration, cracking, scoring or pitting on the bearing cups, rollers, or cones. Replace any bearings with these defects, following the bearing cup replacement procedure found later in this section.

WARNING

The tire, wheel, hub and drum assemblies could weigh over 300 lbs (135 kg) together. When doing seal inspections, therefore, remove the tire and wheel from the hub first, or use an approved tire dolly. This will prevent injury or damage to the seal.

9. When inspecting wheel seals, look for wear, deterioration, distortion or damage at the sealing surfaces. Replace any damaged of defective seals using the seal replacement procedure found later in this section.

10. Reassemble and mount the components in the reverse order and do a bearing adjustment.

11. Install the seal assembly into the hub cavity.

12. Install the inner bearing into the race, then install the seal assembly using the appropriate seal installation tool.

13. Install the hub and rotor assembly onto the spindle, using care not to damage the seal.

14. Install the outer wheel bearing and attaching hardware. Adjust the bearing.

15. Reinstall the caliper assembly and adjust the brakes using the procedures in Section 4C.

16. Reinstall the axle shaft using a new gasket.

17. Fill the hub cavity with one U.S. pint of synthetic lubricant through the fill opening in the axle shaft flange.

18. Install the wheel and tire and torque them to specifications.

WHEEL BEARINGS

CAUTION

Wheel seal integrity can be affected by excessive wheel bearing end play. Incorrect wheel bearing adjustments will eventually lead to bearing or seal failure. When doing wheel bearing adjustments, always inspect the condition of the wheel for any damage.

Use the following procedures to adjust the bearings properly, and to determine the wheel bearing tolerances after adjustment.

Wheel Bearing Adjustment

1. Pry the locking washer tab(s) up and off the outer hex jamnut flats (when present).

2. Remove the outer hex jamnut, lockwasher and lock-ring.

3. Torque the outer bearing's adjusting nut to 100 ft. lbs (136 N m) while rotating the hub. This assures proper contact of all bearing surfaces.

4. Back the adjusting nut off one turn and pre-load the bearing by retorquing the adjusting nut wile again rotating the hub as follows:

   A. Pre-load the front and trailing axle bearings to 20 ft-lbs (27 N m).

   B Pre-load the drive axle bearings to 50 ft-lbs (68 N m).

5. Back the adjusting nut off as follows:

   A. Back off 1/4 turn for drive axle bearings.

   B Back off 1/3 turn for front and trailing axle bearings.

6. Replace the lock ring with an adjusting nut index pin inserted into one of the lock-ring holes and reinstall the lock washer.

7. Replace the locking washer (when present).

8. Reinstall the outer hex jamnut and torque it as follows:

   A. Torque the front and trailing axle bearings to 200 to 300 ft-lbs (271 to 406 N m).

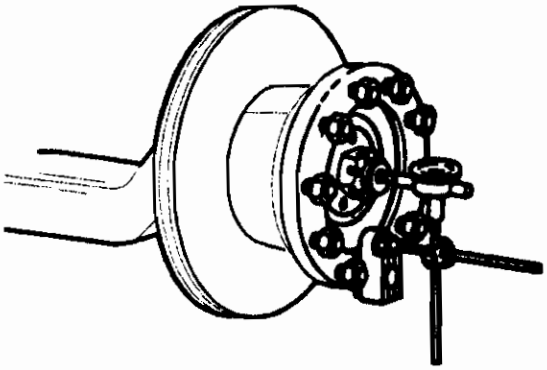
   B Torque the drive axle bearings to 250 to 400 ft-lbs (339 to 542 N m).

9. Bend the tabs over the locking washer over the flats of the hex jamnut mentioned in Step 7.

NOTE: To check the wheel bearing adjustment, refer to "Bearing End Play" following this procedure.

10. Rotate the wheel to check the final bearing adjustment. The wheel must also rotate freely within the specified end play limits.

Printed in Canada.



WITH INDICATOR MOUNTED AT BOTTOM
PUSH/PULL AT SIDES OF ROTOR

Figure 4. Dial indicator installed

Measuring End Play

1. Attach a dial indicator (Figure 4).

2. Adjust the dial indicator so that the pointer is against the center of the spindle and the axis of the spindle and indicator are parallel. Set the indicator to zero.

3. To measure the end play, observe the dial indicator while pushing and pulling on each side of the rotor. End play is the total travel observed and should be within the following range:

Front & trailing axle end play	0.001 to 0.005" (0.025 to 0.127 mm)
Drive axle end play	0.001 to 0.010" (0.025 to 0.254 mm)

NOTE: These end play ranges are based on using pre-lubricated bearings.

4. If the measurement is not within this range, repeat the wheel bearing adjustment procedure.

5. When the end play measurement is satisfactory, remove the dial indicator and reassemble the wheel end components.

Bearing Cup Replacement

1. Where possible, remove the old bearing cup (race) by knocking it out from the opposite end of the hub. Use a long steel drift or punch.

2. Clean and inspect the bearing cup bore. Remove any nicks or burrs that may prevent smooth installation of the new cup with a high-speed grinder, file, or emery cloth.

3. Place the hub on a flat surface and properly locate the new cup over the bore.

4. Using the old bearing cup, gently tap the new cup into its bore. This procedure sets the cup and prevents cocking. A press can then be used to fully install the bearing cup after it has been started in the hole.

5. Turn the hub over and repeat the procedure for the remaining bearing cup.

6. Reassemble the wheel end components and do a bearing adjustment.

WHEEL SEALS

The E-Model uses different seals from previous MCI coaches. The drive axle incorporates unitized seals with Teflon™ sealing material. These new seals combine the seal outer housing, sealing element and wiper into a single replaceable unit, and are pressed into the seal cavity as one assembly. There is no longer a separate wiper or bolted retainer. When replacing seals, always specify the OEM (Original equipment manufacturer) product.

CAUTION

MCI recommends using only the seal manufacturer's prescribed installation tools to properly install the seals. Using these tools ensures correct seal placement. Improper procedures, or using outdated tools could cause seal damage or premature failures.

NOTE: Seal installation tools normally consist of a handle assembly (with spacer/adapter, washer, and hex nut) seal tool (specific to the seal) and bearing centering tool. These tools may be purchased through the manufacturer.

Seal replacement

1. With the hub positioned on a flat surface, carefully pry the seal out of its bore.

2. Clean the bore and inspect it for any nicks or burrs that may prevent installing the new seal. Remove these defects with a small high-speed grinder, file, or emery cloth.

3. Assemble the seal installation tool, using the proper bearing centering tool.

NOTE: The inner bearing cup and cone bearing must be in place to properly center the seal installation tool.

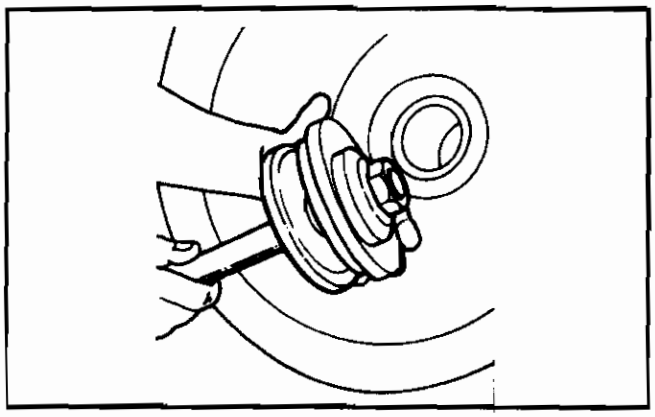


Figure 5. Seal and adapter on the tool rod

4. Set the smaller O.D. of the seal in the recess of the tool adapter (Figure 5).

5. Properly locate the new seal over the bore by inserting the bearing centering tool into the inner bearing race. The centering tool prevents the seal from cocking in the bore (Figure 6).

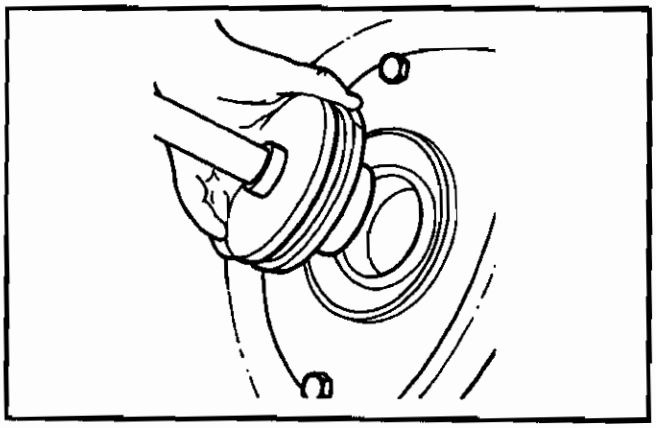


Figure 6. Installing the tool and seal in the hub

6. Hold the tool handle firmly and strike it with a hammer until the seal is fully seated in the bore.

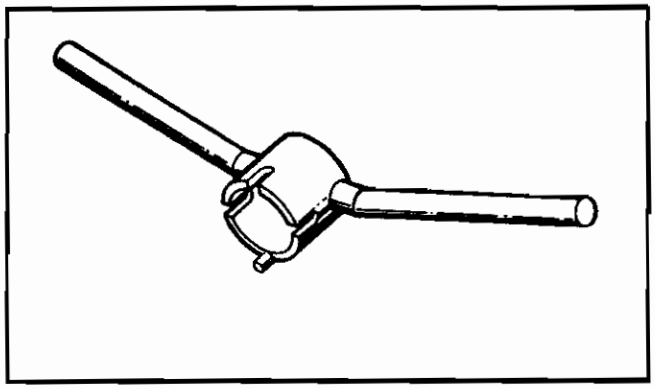
NOTE: The sound of the impact should change as the seal bottoms out.

7. After installing the seal, check it for freedom of movement by inserting your fingers and moving the interior rubber component of the seal backward and forward. A slight movement indicates a damage-free installation.

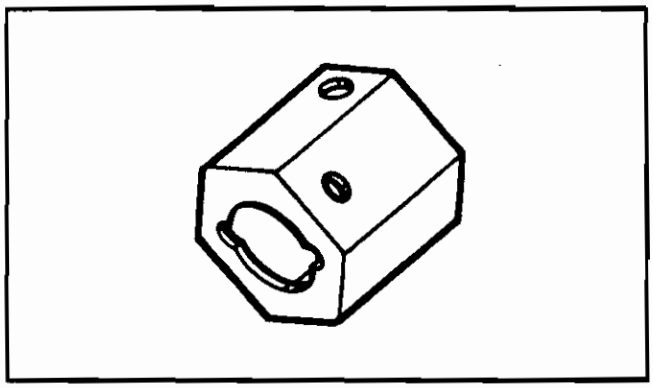
8. Reassemble the wheel end components and do a bearing adjustment.

SERVICE TOOLS

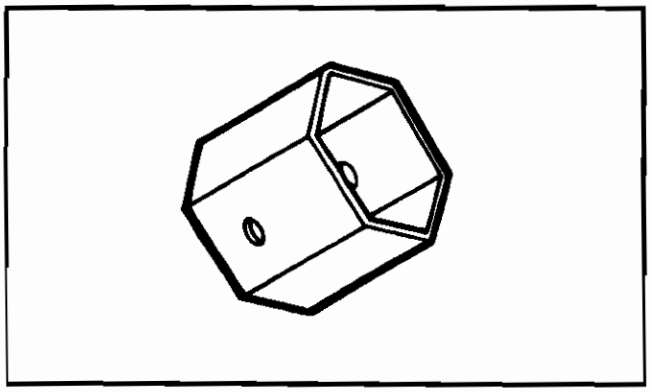
MANY TOOLS LISTED IN THIS SECTION ARE SPECIALLY DESIGNED TO MEET THE NEEDS OF VARIOUS SERVICE OPERATIONS. THEY ARE AVAILABLE FOR PURCHASE THROUGH MOTOR COACH INDUSTRIES, SERVICE PARTS DIVISION AND UNIVERSAL COACH PARTS OR, WHERE PRACTICAL, MAY BE MANUFACTURED BY THE OPERATOR. IN THESE CASES, DRAWINGS ARE AVAILABLE UPON REQUEST.



20-56 Wrench-Front/Trailing Bearing Adjusting Nut



20-167 Wrench-Front & Tag Axle Nut



20-168 Wrench-Rear Main Axle Bearing & Lock Nut

SPECIFICATIONS

BEARINGS

Part number (Front and trailing inner) .....
Part number (Front and trailing outer) .....
Part number (Drive inner) .....
Part number (Drive outer) .....

SEALS

Part number (Front and trailing) .....
Part number (Drive) .....

SECTION 15C

TIRES

CONTENTS OF THIS SECTION

GENERAL DESCRIPTION

The E-Model coaches use special inter-city coach tires designed for on-highway service. These tires are steel-belted radials, and carry a J load rating. The tire size is 315/80R22.5, and the tires mount on 22.5 x 9.00 wide rims. Due to the 16,000 lb. front axle rating, only this size tire mounted on a 9.00 wide rim carries a sufficient load rating for this application. This size tire mounted on a narrower rim is not sufficiently rated. **Use only 315/80R22.5 tires mounted on 9.00 wide rims.**

The only exception to this requirement is for snow tires on the drive axle. In a dual tire application, 12R22.5 or 12.75R22.5 tires on a 9.00 wide rim also carry a sufficient rating. This is true only for the drive axle; the front axle must use 315/80R22.5 tires on a 9.00 wide rim

MAINTENANCE

Many variables can effect tire performance and wear. Improper inflation, improper balance, improper coach ride height, improper alignment, exceeding load limits or speeds, sharp cornering, etc. are just a few examples which have a direct relationship on tire performance and wear.

The correct maintenance procedure is essential to safe and economical tire service. Inspect tires daily: carefully inspect for cuts or foreign matter such as nails, glass, etc. Remove any foreign matter lodged between the tires and dual wheels.

INFLATION

Check tire inflation pressure with an accurate gauge. Check the pressure before starting a run and as recommended by the tire manufacturer. Always use the same gauge to check the pressure, to eliminate any differences resulting from gauge error (Figure 1).

If the pressure loss is greater than normal, remove and inspect the tire to determine the cause. Replace any missing valve caps.

NOTE: Check tire pressure with pressure cold.

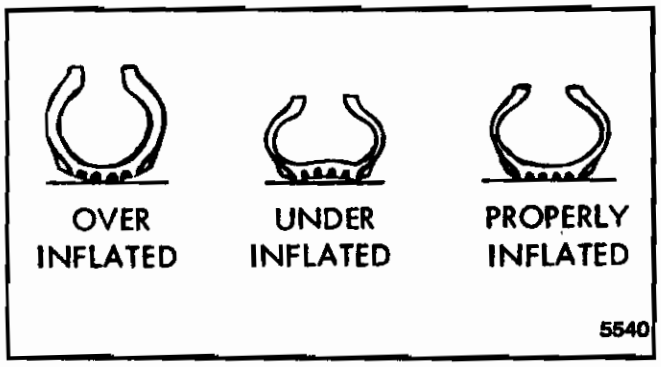


Figure 1. Tire Inflation

The valve core is a spring-loaded check valve in the stem that permits tire inflation. The valve seals the air in the tire. When the valve cap is tightened on the stem, the sealing washer inside the cap presses tightly against the top of the stem, preventing air leaks.

Axle configurations will dictate specific tire pressures. Improper inflation is the greatest cause of accelerated tire wear. Check tires frequently for this condition. Unless correct air pressure is consistently maintained, the tires will not function as they should; consequently, safe, economical operation of the coach will be affected.

An underinflated tire runs sluggishly, heats up quickly because of greater flexing, and is subjected to more frequent bruising. Over-inflation does not compensate for overloading. It does not add strength to the tire; in fact, it weakens the tire by reducing its ability to absorb road shock, and may cause a blowout.

Besides the effect improperly-inflated tires may have on tire life, improperly-inflated tires will degrade steering, riding comfort, and safe driving.

All tires on the same axle should always carry the same air pressure. A difference in air pressure between rear tires and front tires may be permissible within certain limitations; however, there should not be a difference in pressures between the right and left tires on the same axle. A 5 psi (34.5 kPa) underinflation in one front tire can not only cause hard steering, but can create steering hazards which may cause an unsafe condition. An underinflated rear tire can seriously affect braking. Balance tire pressures for steering ease, riding comfort, driving safety, and for minimum fuel consumption and maximum tire mileage.

Recommended inflation pressures are shown below and in the tables at the end of this section.

102EL3

FRONT ..... 115 PSI (COLD)
DRIVE ..... 95 PSI (COLD)
TRAILING ..... 95 PSI (COLD)

REPLACEMENT

CAUTION

Always replace tires with the same size tire as originally came with coach. Failure to do this may result in poor engine and transmission performance due to incorrect road speed input into electronic control systems.

Changing tires, especially to the new low profile tires now available, may affect clearances and revolutions per mile. Before making changes to tires with different specifications, ensure that the replacement tires have adequate clearances and that the revolutions per mile are not seriously affected.

Customers who have already changed to replacement tires, especially to low profile tires, should check to ensure that the tires are not rubbing and that the revolutions per mile have not affected the speedometer reading.

ROTATION

NOTE: Before rotating tires, consult the tire manufacturer. They are the source for directions relating to specific tires.

Rotate radial tires only when necessary. If the tires are wearing evenly, there is no need to rotate them. If irregular wear becomes apparent, or if the wear rate on the tires is perceptively uneven, rotate the tires in such a manner as to alleviate the problem. There is no restriction on crisscross rotation.

Install new tires on the front wheels where they run coolest. Always place baggage as far to the rear as possible. This puts the load on the rear axle and reduces front tire stress.

Safety Precautions

WARNING

Exercise care when handling wheels and tires. Careful attention to the following suggestions will prevent injury. Make it a rule to respect the explosive force contained in an inflated tire.

1. Prepare for any tire repair operation in a proper way. In servicing tires, be careful not to drop them on the feet, hands or body, or heavily on the floor. Practice proper lifting methods. When carrying tires or wheels, avoid oil and objects on the floor. Keep the floor clean and dry (Figure 2).

2. Deflating a tire properly is very important. First reduce pressure as much as possible by pushing the valve core plunger. Keep your eyes away from the valve. Remove the valve core to ensure complete deflation. Wear approved safety glasses or goggles when using compressed air.

3. Demounting tires from wheels requires special care. Tires on drop center rims are best handled on a wheel holder, or tire changing machine. This will prevent cuts on the hands and wrists and will make it unnecessary to use a mallet for seating the tire. Use only standard tire mounting tools and equipment. Using makeshift tools, screwdrivers, or pliers to force tires on or off rims or wheels is dangerous.

4. Use special care when using tire irons. Grip them firmly and keep them free of oil and grease. They can slip and fly with tremendous force.

5. After removal, inspect the tire carefully and do all necessary repairs. A tire spreader is helpful, but use care when working around it. Keep spreader arms closed when the machine is idle.

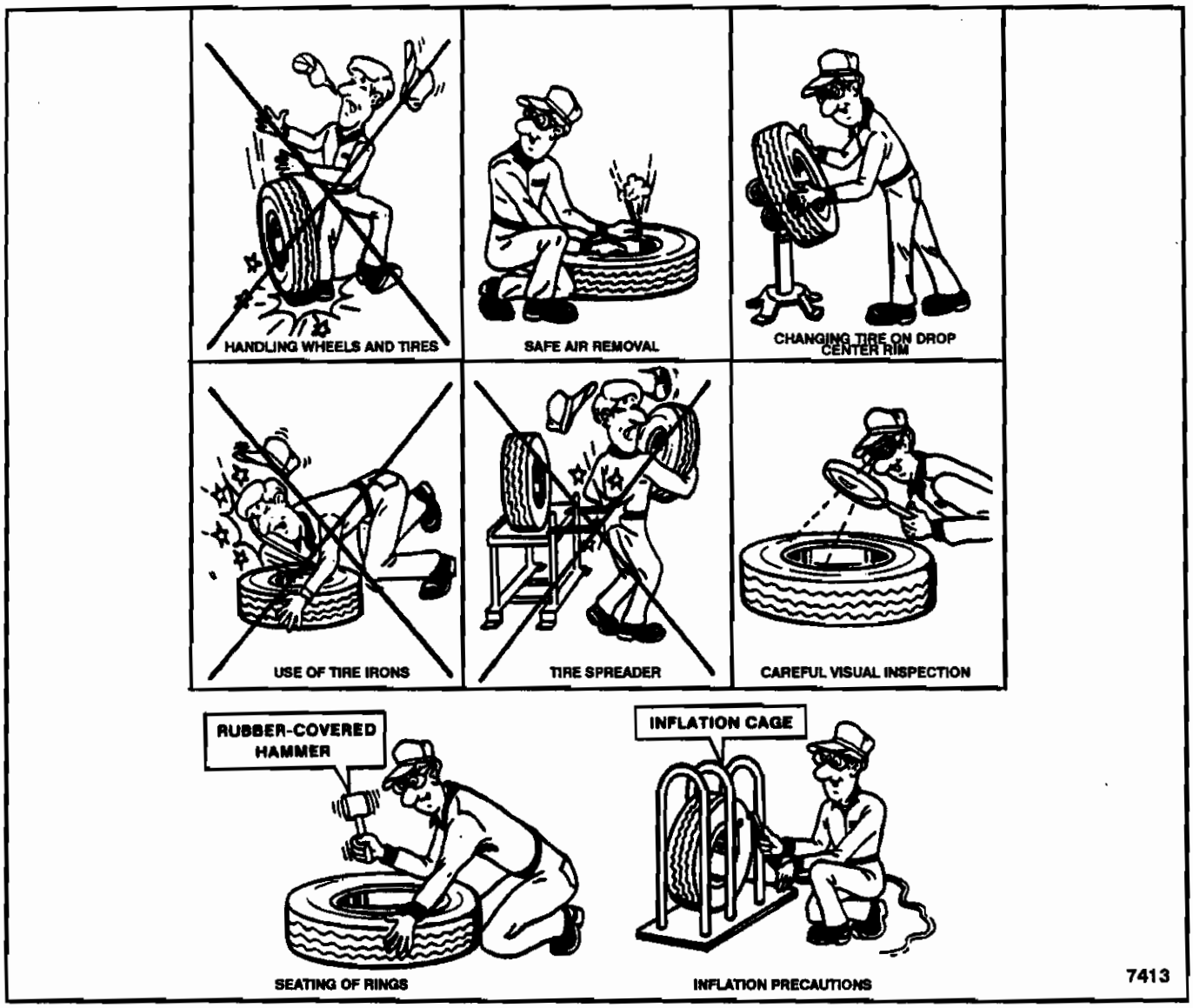


Figure 2. Safety Precautions

6. Inspect wheel parts carefully for rust, damage, or distortion. Never use wheels which are out of shape, rusted, cracked or broken in any way. Never use a ring or other rim parts of different manufacturers than the original rims, or any different size or type than supplied with the coach. Tires or rims often require buffing before mounting, after making repairs. Always wear safety glasses or a face shield when buffing tires or rims.

7. Avoid hammering on wheels with steel hammers. Small bits of steel may break off the hammer or rim and fly into eyes, face, or body. Use rubber covered, steel-headed hammers whenever possible.

8. Stand away from the valve stem as far as possible when inflating tires. Avoid a position where the face or body is immediately over the work being done on any tire in which there is pressure. Use only accurate, tested gauges to ensure proper air pressure.

Manual Tire Changing

NOTE: This procedure applies only to tires on demountable rims. Tools required:
Two tubeless tire tools,
one pair of vise-grip pliers,
lubricant, and
brush.

Use only rims free from damage, rust or pitting.

CAUTION

Avoid using any lubricants (soaps) which contain compounds injurious to rubber.

DEMOUNTING

1. Deflate the tire completely by removing the valve stem.

2. With the tire lying flat, loosen both beads by walking on the tire with heels close to the rim.

3. With the wide side of the rim down, lubricate the top bead.

4. With the stops towards the rim, insert the spoon ends of both tools about 10 inches (254 mm) apart.

5. Holding the bead in the well with your foot, pull one tool toward the center of the rim (Figure 3).

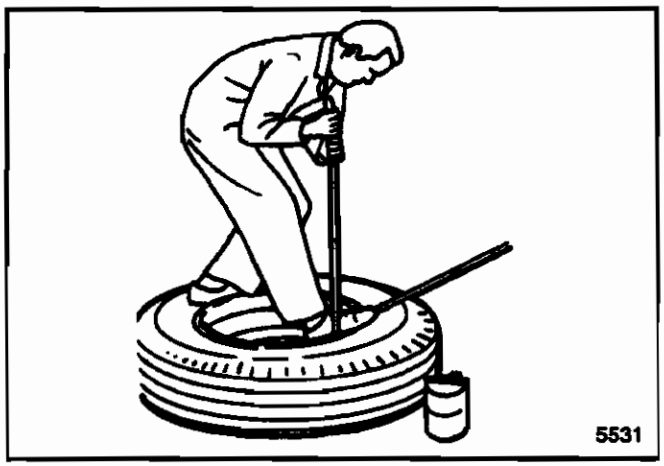


Figure 3. Pulling First Tool Toward Center

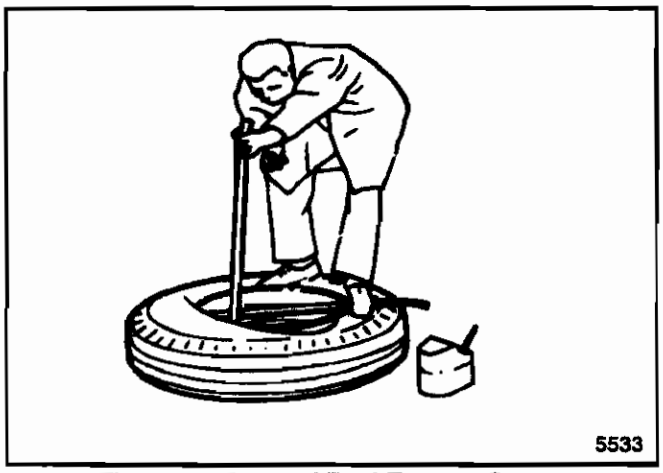


Figure 4. Second Tool Toward Center

6. Hold the tool in position with one foot and pull your second tool toward the center of the rim. Progressively work the bead off the rim, taking additional bites as necessary (Figure 4).

7. Stand the assembly up vertically. Lubricate the second bead.

8. At the top of the assembly, insert the straight end of the tool between the bead and the back flange of the rim at about a 45 degree angle. Turn the tool so that it is perpendicular to rim. Pry the second bead off (Figure 5).

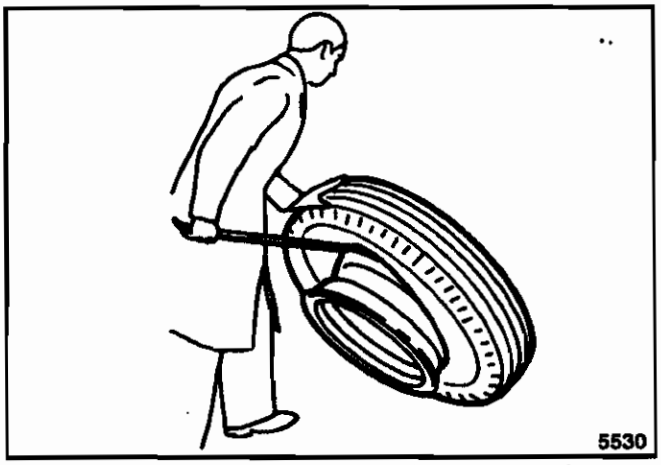


Figure 5. Prying Off the Second Bead

MOUNTING

1. Be sure to use the correct valve and install it properly in the rim. Inspect the rim to ensure the bead seats are clean and smooth.

2. Place the rim on the floor with the side down and lubricate the first bead of the tire and upper bead seat of the rim (Figure 6).

Figure 6. Applying Lubricant

3. Push first bead into the well of the rim and onto the rim as far as possible.

4. Using the tool's straight end (with the stop resting on the rim flange), take small bites to work the remaining section of the first bead onto the rim. (Figure 7)

5. Hold the second bead in the well by standing on the tire, and anchor it with vise-grip piers (snub side towards the tire).

6. Using the spoon end of the tire tool with the stop toward the rim, take small bites until the bead slips over the flange. If necessary, insert the second tire tool and lubricate the last 6 inches (152 mm) of bead before completely mounting the tire (Figure 8). Inflate the tire to the recommended pressure. Examine the valve assembly occasionally to avoid leaks.

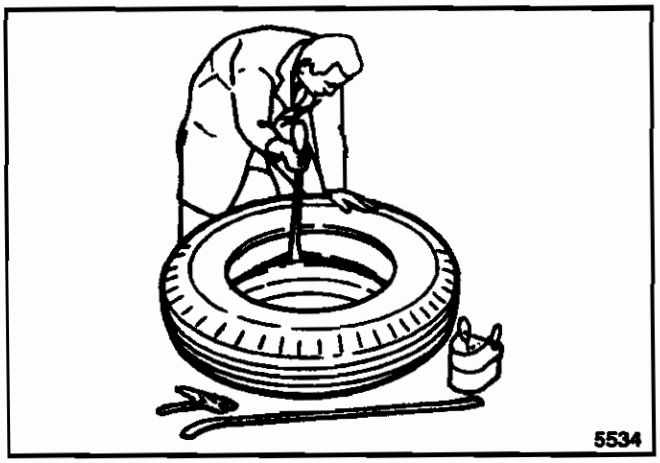


Figure 7. Installing First Bead On Rim

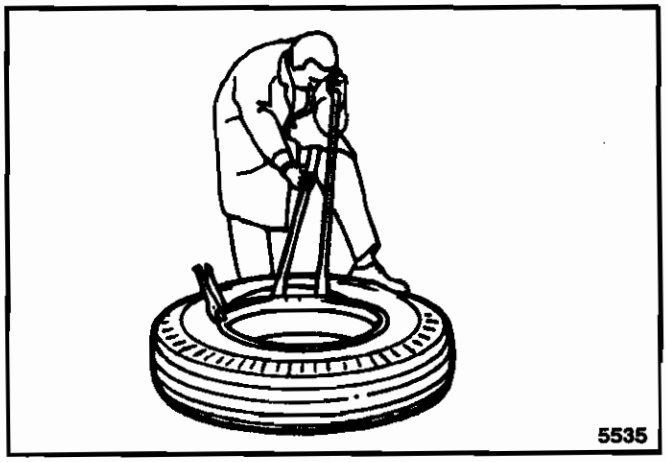


Figure 8. Installing Second Bead

Tire Inflation Chart

Make and type	Size	Front Pressure	Drive Pressure	Tag Axle Pressure
Goodyear G391	315/80R22.5	120 psi (827 kPa)	85 psi (586 kPa)	105 psi (723 kPa)
Goodyear G124 (Snow tires)	12R22.5	Not approved	85 psi (586 kPa)	Not approved
Michelin XM + S4 (Snow tires)	12R22.5	Not approved	95 psi (655 kPa)	Not approved
Firestone HP3000	315/80R22.5	120 psi (827 kPa)	85 psi (586 kPa)	105 psi (723 kPa)
Goodyear G291	315/80R22.5	120 psi (827 kPa)	85 psi (586 kPa)	105 psi (723 kPa)
Michelin PXZA 1	315/80R22.5	120 psi (827 kPa)	90 psi (620 kPa)	105 psi (723 kPa)

ISO RATINGS

ISO ratings are the maximum load that a tire can carry at the speed indicated by the speed symbol.

ISO Rating	ISO Rating	ISO Rating	Speed Symbol
141/5677 lbs.	146/6615 lbs.	151/7607 lbs.	B=50 MPH
142/5843 lbs.	147/6780 lbs.	152/7827 lbs.	C=60 MPH
143/6008 lbs.	148/6945 lbs.	153/8048 lbs.	D=65 MPH
144/6174 lbs.	149/7166 lbs.	154/8268 lbs.	E=70 MPH
145/6394 lbs.	150/7386 lbs.	155/8544 lbs.	F=80 MPH

GROSS VEHICLE WEIGHT RATINGS

GVWR (102EL3)	49,900
Front Axle GAWR	16,000
Drive Axle GAWR	23,000
Trailing Axle GAWR	16,000

Printed in Canada.